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TART2002 Installation

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What Computer Should You USE?

The following comments regarding CRAY computers is today out-of-date, but I've left these comments here because the remarks concerning 32 versus 64 bit computers is still relevant, and will become even more relevant in the next few years as more and more 64 bit computers become available. I am not going to try to tell anybody how to do their job, but I will point out the advantages of using a 32 bit computer instead of a CRAY. If you have access to a variety of computers, the decision as to which you use is naturally strictly up to you. However, please consider the following points.

The CRAY is a great computer for running codes that can take advantage of its **vector capabilities**. However, TART2002 is a **scalar code**, designed to run on virtually any computer, and it does not take full advantage of the CRAY's capabilities. If you read the TART2002 documentation, or see my website,

http://www.llnl.gov/cullen1/speed.htm

you will find a table comparing the running time of TART2002 on a variety of computers. You will find from this table that there are now a variety of 32 bit computers that can run TART2002 faster and much cheaper than a CRAY can. For example, a 1200 MHz Laptop computer runs TART2002 40 times as fast as a CRAY YMP, and a newer 3000 MHz PC runs TART2002 57 times as fast as a CRAY YMP. Remember, the times in this table for CRAY are CPU times. If many users are using the CRAY at the same time it can take much longer than the time given here until the actual time that your run finishes and you have the results. In contrast for the 32 bit systems the times in this table are roughly the time until you actually have the results. Therefore if you factor in the cost of your salary while you are waiting for results, the advantage of 32 bit computers over the CRAY is even larger than indicated in this table.

A second point to consider is that TART2002 is a complete system, that will help you prepare and verify TART2002 input, and analyze TART2002 output results. Using the entire system can save you enormous amounts of time and energy. However, you will only be able to use the entire system on 32 bit computers, i.e., the interactive graphics codes currently only work on 32 bit computers, not on a CRAY. Even if you do decide to use a CRAY to run TART2002, I strongly recommend that you implement the remainder of the system on a 32 bit system, e.g., UNIX workstation, IBM-PC, or POWERMAC. Believe me when I say, having these codes available will save you enormous amounts of time and energy, and minimize your frustration when preparing input and analyzing output. **Note that it is planned to make the entire TART system available on 64 bit computers in the coming years, as they replace the current 32 bit computers.**

Overview

This installation manual is divided into seven parts,

1) An Overview of TART2002 CD and what all users should know
2) IBMPC (Windows)
3) LINUX
4) POWERMAC
5) UNIX
6) CRAY/64 Bits
7) OTHER Computers

All users should read the Overview. The remaining parts are relevant only to users of each specific type of system. For users of OTHER types of computers, first read the section on OTHER, that explains computer dependence, then read the UNIX or CRAY/64 Bits section.

Format of TART2002 CD

This CD is written in the ISO 9660 format, which is designed to allow a CD to be read on any computer. As applied to TART2002 CD, there are several important limitations of the ISO 9660 format including,

1) Filenames are limited to the DOS 8.3 convention (names up to 8 characters in length, optionally followed by an extension of up to 3 characters). Fortunately the TART2002 system already conforms to this limitation,

2) This format cannot distinguish between upper and lower case characters. Since TART2002 CD uses upper and lower case filenames, this could present an initial problem during installation.

I have attempted to minimize the impact of these limitations on users by supplying compressed, combined files for use on all computers (IBMPC, LINUX, POWERMAC, CRAY, and UNIX). When uncompressed and installed these files will expand to properly define all of the filenames used by TART2002.

The only exceptions will be the compressed file, TARTZ.Z, and installation file, INSTALL.BAT that is included for UNIX, LINUX and CRAY. When you copy these files from the TART2002 CD the names may end up on your computer in lower case (install.bat), upper case (INSTALL.BAT), or a mix of the two. In the following installation instructions I will assume these files are named TARTZ.Z and INSTALL.BAT. If they are not, please change them to be EXACTLY upper case names.

Reading Documentation

Because of differences in file systems, on some computers (particularly PowerMAC) you may have trouble reading the Microsoft Word and PDF formatted documentation. If you do, I suggest that you use a web browser to download the documentation either from the TART2002 CD, or from my website,

http://www.llnl.gov/cullen1

This should eliminate any incompatibilities due to restrictions based on the format of the CD.

Note – because of the PowerMAC's file system it is may not be sufficient to copy the files from the TART2002 CD to your MAC. However, if you use a web browser to access and copy the files, your MAC is smart enough to produce the hidden files needed by your MAC to later properly access these files.

Reading TART2002 CD

A commercially produced CD has a slightly different reflectivity, when compared to a TART2002 CD that I produce on my IBM-PC at home. This may initially cause your system to have a problem reading TART2002 CD. If it does, open your CD drive, jiggle the CD around a little to re-position it, and then try again. It generally doesn't take more than a few tries until you can read TART2002 CD, and once you read it, you are finished using it.

Contents of TART2002 CD

This CD contains,

Level 1: Documentation and Computer Systems

WARNING – previous versions of the TART CD included documentation with the files for each code system. Starting with TART2002, documentation is ONLY included once on the CD at Level 1. Do not forget to download the documentation to your computer.

The CD includes on-line documentation and the system of codes for a variety of computers. For a specific computer (e.g., IBM, POWERMAC, etc.) you ONLY need ALL the files in the directory for that computer,

DOCUMENT
IBMPC
LINUX
POWERMAC
CRAY
UNIX

ALL users should have a copy of the documentation. On-line documentation is in Microsoft Word and Adobe PDF formats created on an IBM-PC, but can be read by most word processing codes; see the above warning concerning PowerMAC.

For IBMPC, LINUX and POWERMAC EXECUTABLE codes are provided. In these cases compressed, combined files are provided, that can be easily installed and immediately used.

Since there are a variety of CRAY/64 Bit computers and UNIX workstations, SOURCE codes and installation instructions are provided. In this case a compressed, combined file is provided, that can be used to easily install everything. Using the compressed, combined files requires using UNIX tar uncompress. The UNIX directory should be used for all variants of UNIX, e.g., DEC, HP, IBM-RISC, Meiko, SGI, SUN etc.

For OTHER computers, it is recommended that you use the combined file from the UNIX or CRAY/4 Bits directory.

Level 2: The Code System

WARNING – previous versions of the TART CD included documentation with the files for each code system. Starting with TART2002, documentation is ONLY included once on the CD; see the above description of Level 1.

For each type of computer you will find sub-directories,

Production Codes and input data

TART2002 - Execute TART2002
UTILITY - A collection of executable utility codes
EXAMPLES - Example TART2002 input files
CRITS - Example critical assembly TART2002 input files

Interactive Graphics Codes (not included for CRAY)

TARTCHEK - Check TART input, and overlay results on geometry
TARTAID - Create TART input files
IMAGES - Create industrial and medical images
EPICSHOW - Plot Neutron, Photon, Electron and Charged Particle data
PLOTTAB - General plotting code used by utility codes
EDITOR - FORTRAN and TART input editor

CRAY and UNIX users should have two additional sub-directories,

TARTDATA - Create TART2002 binary data files
EPICDATA - Create EPICSHOW binary data files

These two directories can be deleted once installation is completed.

WARNING - There are files in several of these directories that have the same name - therefore be sure that you keep ALL of these files in separate directories.

Recommended Directory Structure

The installation instructions explain how to set up a directory structure during installation, so you need not do this before hand. It is mentioned here only to encourage you to use the **Recommended Directory Structure** during installation.

It is HIGHLY RECOMMENDED that you set up a directory structure to include all parts of this system in a directory named TART2002. The INSTALL.BAT files will automatically uncompress everything assuming the recommended directory structure, including the sub-directories named above.

PLEASE use this recommended directory structure to insure that future updates to this system can be easily added to your computer.

Level 3: Neutron and Photon Data

Standard data files included in this package are,

1) Neutron interaction the data is derived using **ENDFENDL2002** and include 700 group neutron data derived using a combination of ENDF/B-VI, Release 8 and ENDL data. TOTAL and PROMPT NU-BAR are both provided in this file. The

700 group structure extends from 10^{-5} eV up to 1 GeV. Presently nuclear data is only available up to 20 MeV, so that only 616 of the groups are currently used.

2) For photon interaction 701 point photon data derived using the Livermore **EPDL97** file. The new 701 point structure extends from 100 eV up to 1 GeV, and is currently used over this entire energy range.

The older 175 group ENDL neutron is no longer supported by TART.

General Information

Recommended Filenames

When using TART2002 you can optionally input filenames for input parameters and the output report,

Tart02-4 [input filename] [output filename]

Where [input filename] and [output filename] default to TART.IN and TART.OUT respectively.

It is STRONGLY RECOMMENDED that you only use the default filenames TART.IN and TART.OUT for input and output. All of the other codes in the TART2002 system use these standard filenames, and you will find it is much easier to use the entire system if you use these default filenames.

Moving Files between Computers

All of the files on this CD have been written as native binary for each type of computer. If you move any of these files between computers you MUST move them as BINARY.

Because of the LOWER and UPPER case filename conventions used by TART2002 if you move files between case insensitive and case sensitive computers, e.g., copying TART.IN from an IBM-PC to UNIX computer you may end up with a file named tart.in - in which case you should rename it to TART.IN.

The Use of Binary, Random Access Files

WARNING - The procedures used to produce and use binary, random access files is EXACTLY the same on EVERY computer. However, the physical layout of the actual data files varies from one computer to another. THEREFORE UNDER NO CIRCUMSTANCE SHOULD YOU TRY TO USE THE BINARY FILES PRODUCED ON ONE TYPE OF COMPUTER ON A DIFFERENT TYPE OF COMPUTER. Separate binary files MUST be created on EACH type of computer that you use.

System Wide Installation

If you wish you can install TART2002 so that it is accessible to everyone on your system, without the necessity of their having their own copy of the code and its data files.

By placing TART2002 and its 4 data files in a common directory and defining paths most computers are smart enough to search this common directory for both TART2002 and its data files

If your computer isn't smart enough to find the 4 data files, in TART2002 see, SUBROUTINE OPENTART for instructions on how to add a path to your common directory to find the four data files. From SUBROUTINE OPENTART you will see that you can add a path to the data.

If you do this TART2002 will: 1) first search for the file in the current directory, 2) if it isn't found, next search using the path you have defined.

The Next Level

Once you have selected the codes for your type of computer, i.e., the directory IBMPC, LINUX, POWERMAC, CRAY, or UNIX, see the part of this installation manual that applies to your type of computer, for final installation instructions.

Register as a User

It is important that you register as a user of this system, so that you are included on our distribution list for newsletters and code updates.

If you have access to e.mail send your e.mail address and complete postal mailing address to me at,

Cullen1@llnl.gov

If you do not have access to e.mail send your complete postal mailing address to me at the above address.

You can HELP

Improvements to systems such as this depend heavily on user feedback. If you find any errors in the documentation or codes, or have suggestions for improving the system, please inform me, preferably by e. mail.

Sending me complete documents or codes saying you have "fixed" them is a waste of your time and mine. Usually when there is an error many users will find it, and if they all send me “fixed" versions, I have no idea which of them is the "best fix", and more importantly I have no idea if the "fix" works on every computer. Before including any "fixes" I have to decide what is the "best fix" from the viewpoint of the entire TART2002 system and its use on many different types of computers.

Please keep your corrections as short as possible, e.g., a sentence or two from documents, a few lines from codes - in either case including both the original and your suggested changes.